Perceptions and Patterns of Self-Medication Among Undergraduate Medical, Allied Health Sciences and Non-Medical Students in Peshawar, Pakistan

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ABSTRACT

Background: The act of choosing and using medications to address diseases or symptoms that one has self-identified, or for which one has made one's own diagnosis is known as self-medication. Over-the-counter (OTC) medications and dietary supplements, which are frequently used to address common health conditions at home, are the most commonly utilized self-medicating substances. This study was designed to assess the perceptions and self-medication practices among medical, allied health sciences and non-medical students.

Methods: Over a six-month period, this research project was conducted in Peshawar, Pakistan. An observational, cross-sectional study approach was used. Through non-probability convenient sampling technique 744 responses were recorded through self-structured questionnaire. The data was then analyzed through SPSS version 26, through descriptive statistics and applying chi-square test.

Result: The mean age of the Participants was 20.98 ± 1.768. There were 37.5% female participants and 62.5% male participants in the study. The most popular source of information was previous prescription, followed by internet and books. 40.6% of the Participants were ready to give up self-medication and 60.2% opposed encouraging others to self-medicate. Cold, headache, fever and sore throat were among the common symptoms for which the participants self-medicated through pain killers, antibiotics and anti-pyretic drug classes.

Conclusion: Self-medication practices were common among students studying medicine, allied health disciplines, and non-medicine. The majority of participants did not support encouraging others to advocate self-medication, despite their unwillingness to give up their self-medication habits.

Keywords: Self-Medication, Over-the-Counter Drugs, Antipyretics, Pain Management, Anti-Bacterial Agents, Analgesics.

HOW TO CITE: Zahir S, Khan K, Mazhar S, Haq SA, Khan Z, Maryam, Amna. Perceptions and Patterns of Self-Medication Among Undergraduate Medical, Allied Health Sciences and Non-Medical Students in Peshawar, Pakistan. National Journal of Life and Health Sciences. 2024 Sept; 3(2), 80-86.

DOI: https://doi.org/10.62746/njlhs.v3n2.67

Date of Submission: 08/07/2024 Date of Revision: 11/08/2024 Date of Acceptance: 20/08/2024

INTRODUCTION

The act of choosing and using medications to address diseases or symptoms that one has self-identified, or for which one has made one's own diagnosis is known as self-medication.[1] Over-the-counter (OTC) medications and dietary supplements, which are frequently used to address common health conditions at home, are the most commonly utilized self-medicating substances. These can be purchased without a prescription in several countries from supermarkets and convenience stores.[2] Healthcare is starting to place more and more emphasis on self-medication. By empowering patients to make decisions about the treatment of mild ailments, it helps patients become more independent. Self-medication benefits healthcare systems as well since it makes it easier to employ clinical skills, makes medication more accessible, and may help lower the cost of prescription drugs for publicly financed health programs.[3] Also, the expense of treatment, travel time, and doctor's time, or consultation time, are all reduced with responsible self-medication.[4] Although OTC medications are thought to be generally safe, their improper use could have serious consequences.[5] Resources are wasted, pathogens become more resistant, and poses major health risks such as unpleasant reactions and prolonged suffering. In underdeveloped nations where antibiotics are widely available without a prescription, antimicrobial resistance is a real issue.[6] The most often utilized class of pharmaceuticals for self-medication purposes includes analgesics, antipyretics, antibiotics, antiacids, antimicrobials, anthelminthics, antitussives, antihistamines, common cold tablets and syrups, vitamins, and nutritional supplements.[7] Self-medication is frequently sourced from families, friends, neighbors, pharmacy, previously prescribed medications, or advice from advertisements in newspapers or popular magazines.[8] To control responsible self-medication, the government should make safe medications available, provide clear usage instructions, and ensure

Research Article
ISSN: 3006-5852 & ISSN: 3006-5844

individuals seek medical advice when necessary.[9] In view of the rising trend of self-medication everywhere, this study was designed to assess the perceptions and self-medication practices among medical, Allied health sciences and non-medical students.

METHOODLOGY:

From October 2023 to March 2024, a six-month period, this research project was conducted. An observational, cross-sectional study approach was used. In Peshawar, Pakistan, the study was conducted in various medical, allied health sciences (AHS), and non-medical institutes. Convenient non-probability sampling was the method used for sampling. The sample size calculated over 99% confidence level was 664, (n = [DEFF*Np(1-p)]/ [(d2/Z21-α/2*(N-1)+p*(1-p)]). Across multiple colleges, questionnaires and Google forms were distributed. A total of 744 complete answers were obtained. Of the participants, 250 were from the allied health sciences (13 pharmacy, 32 DPT, 205 nursing), 184 were non-medical students, and 310 were from the medical field (295 MBBS, 15 BDS). Students enrolled in undergraduate programs in medicine, allied health sciences, and non-medical institutes in Peshawar met the inclusion criteria. Being unable to provide informed consent, not being enrolled in the approved programs, declining to participate voluntarily, and turning in incomplete questionnaires were among the exclusion grounds. Each participant was given comprehensive information on the objectives and aim of the research, as well as the freedom to decline participation or to withdraw at any time without repercussions. Verbal consent was sought, and assurances were given regarding the anonymity and confidentiality of their responses. The Institutional Review Board and Ethics Committee at the Northwest School of Medicine, Peshawar granted approval for the study design. (IRB&EC/2023-SM/066) (Issuance date: 20th March, 2023). Data were gathered using a self-structured, standardized questionnaire that was pilot tested after a comprehensive literature study. The three portions of the questionnaire were dedicated to student's self-medication perceptions, self-medication practices, and demographics. First-year and second-year students were placed in junior years, while third, fourth, and final-year students were placed in senior years. The SPSS version 26 was used to analyze the data. Frequencies, percentages, means with standard deviations, and other descriptive statistics were used. Additionally, the chi-square test was applied to examine the association between the responses from medical, allied health sciences and non-medical students, with a significance level of 0.05 to determine any significant differences.

RESULTS:

The participants ranged in age from 17 years old to 26 years old, with a mean age of 20.98 ± 1.768. There were 279 (37.5%) female participants and 465 (62.5%) male participants in the study. 308 (41.4%) of the students were in their senior year and 436 (58.6%) were in junior years. 55.1% of people were ill within the past year, compared to 44.9% who did not have any illness. The demographics of the participants are mentioned in Table 1.

Table 1: Demographics of the Participant.

Variables	Medical (%)	Allied Health Sciences (%)	Non-Medical (%)	Total (%)
Gender of Participants				
Male	153 (32.9)	191 (41.1)	121 (26)	465 (100)
Female	157 (56.3)	59 (21.1)	63 (22.6)	279 (100)
Year of Study of Participants				
Junior Years	186 (42.7)	104 (23.9)	146 (33.5)	436 (100)
Senior Years	124 (40.3)	146 (47.4)	38 (12.3)	308 (100)
Have you experienced any illnesses in the past year?				
No	118 (35.3)	129 (38.6)	87 (26.0)	334 (100)
Yes	192 (46.8)	121 (29.5)	97 (23.7)	410 (100)
Total	310 (41.7)	250 (33.6)	184 (24.7)	744 (100)

Of the participants, 34.8% were aware of the negative effects caused by pharmaceuticals, 12.6% were aware of generic drugs, and 52.6% were aware of over-the-counter drugs. (P-Value = 0.001) For 180 participants (25.1%), the most popular source of information was an old prescription; internet usage was next, with 148 participants (19.9%) and books 131 (17.6%) following suit. (P-Value = 0.000) According to 75.5% of the participants self-care included self-medication. In the future, 67.6% of students said they would be willing to self-medicate. (P-Value = 0.045) 40.6%, however, were prepared to give up self-medication. (P-Value = 0.022).

Furthermore, 60.2% of the students opposed encouraging others to self-medicate. (P-Value = 0.000). Drug poisoning was known to 14.9% of participants, drug interactions to 16.5% participants, and drug resistance to 21% of participants, yet interestingly, 21.1% of individuals reported no adverse effects as an outcome of self-medication. (P-Value = 0.011) Regarding the prevention of self-medication, the opinions of 42.2% and 29.7%, respectively, were that awareness should be raised and the supply of pharmaceuticals without prescriptions should be stopped. (P-Value = 0.014) The results are summarized in Table 2.

Table 2: Perceptions of Participants regarding self-medication.

Variables	Medical (%)	Allied Health Sciences (%)	Non-Medical (%)	Total (%)	P-Value	X^2-Value
Do you know anything about the aspects of using medicinal products without prescription?						
Awareness about OTC drug	165 (42.2)	151 (38.6)	75 (19.2)	391 (100)	0.001	19.405
Awareness about Generic drugs	43 (45.7)	28 (29.8)	23 (24.5)	94 (100)		
Awareness about side effects of drugs taken	102 (39.4)	71 (27.4)	86 (33.2)	259 (100)		
Before utilizing the medication, did you try to find out more about it?						
No	31 (30.1)	26 (25.2)	46 (44.7)	103 (100)	0.000	25.526
Yes	279 (43.5)	224(34.9)	138 (21.5)	641 (100)		
Where do you get your information regarding drugs from?						
Old Prescription	103 (55.1)	42 (22.5)	42 (22.5)	187 (100)	0.000	81.090
Books	45 (34.4)	70 (53.4)	16 (12.2)	131 (100)		
Pharmacists	15 (17.2)	44 (50.6)	28 (32.2)	87 (100)		
Family Members	63 (50.8)	24 (19.4)	37 (29.8)	124 (100)		
Internet	53 (35.8)	50 (33.8)	45 (30.4)	148 (100)		
Drug Products Leaflets	19 (57.6)	8 (24.2)	6 (18.2)	33 (100)		
Friends studying medicine	12 (35.3)	12 (35.3)	10 (29.4)	34 (100)		
Does self-care include self-medication?						
No	74 (40.7)	64 (35.2)	44 (24.2)	182 (100)	0.876	0.264
Yes	236 (42)	186 (33.1)	140 (24.9)	562 (100)		
Would you still continue to self-medicate?						
No	91 (37.8)	96 (39.8)	54 (22.4)	241 (100)	0.045	6.205
Yes	219 (43.5)	154 (30.6)	130 (25.8)	503 (100)		
Would you consider quitting self-medication?						
No	195 (44.1)	131 (29.6)	116 (26.2)	442 (100)	0.022	7.670
Yes	115 (38.1)	119 (39.4)	68 (22.5)	302 (100)		
Would you recommend self-medication to others?						
No	194 (43.3)	172 (38.4)	82 (18.3)	448 (100)	0.000	27.226
Yes	116 (39.2)	78 (26.4)	102 (34.5)	296 (100)		
Before self-medicating, do you read the package brochures for drugs?						
No	91 (46.4)	46 (23.5)	59 (30.1)	196 (100)	0.002	12.683
Yes	219 (40.0)	204 (37.2)	125 (22.8)	548 (100)		
To what extent did you comprehend the prescription information instructions?						
Fully Understood	116 (39.7)	122 (41.8)	54 (18.5)	292 (100)	0.000	25.104
Partially Understood	174 (45.3)	107 (27.9)	103 (26.8)	384 (100)		
Not at all	20 (29.4)	21 (30.9)	27 (39.7)	68 (100)		
What adverse effects might self-medication have?						
Drug Interaction	53 (43.1)	52 (42.3)	18 (14.6)	123 (100)	0.011	26.029
Drug Poisoning	43 (38.7)	33 (29.7)	35 (31.5)	111 (100)		
Masking of underlying disease	21 (42)	16 (32)	13 (26)	50 (100)		
Drug Dependence	50 (47.6)	26 (24.8)	29 (27.6)	105 (100)		
Disease Aggravation	13 (31)	20 (47.6)	9 (21.4)	42 (100)		
Drug Resistance	74 (47.4)	52 (33.3)	30 (19.2)	156 (100)		
No ADVERSE outcome	56 (35.7)	51 (32.5)	50 (31.8)	157 (100)		
How do you feel about the prevention of self-medication?						
Prevent supply of medicine without prescription	104 (47.1)	68 (30.8)	49 (22.2)	221 (100)	0.014	19.220
Awareness and education regarding implications of self-medication	132 (42)	114 (36.3)	68 (21.7)	314 (100)		
Enforcing strict rules regarding misleading pharmaceutical advertising	27 (44.3)	18 (29.5)	16 (26.2)	61 (100)		
Working towards making health facilities easily available	28 (40.6)	22 (31.9)	19 (27.5)	69 (100)		
No opinion	19 (24.1)	28 (35.4)	32 (40.5)	79 (100)		

In the past year, 71.9% of our subjects engaged in self-medication. (P-Value = 0.028) Self-medicating was motivated, in part, by knowledge of the drug (318/744), the moderate nature of the disease (293/744), and prior knowledge (172/744).

Also 36/744 stated that the physicians and nurses are impolite. (P-Value = 0.000) Cold, Headache, Fever and sore throat were among the common illness for which the participants self-medicated. (P-Value = 0.000) The commonly used drug classes were, pain

killers, antibiotics and anti-pyretic (P-Value = 0.000) 75.7% of participants said they would self-medicate as soon as symptoms appeared, 16.4% said they would do so after a lab test confirmed it, and 5% said they would do so to prevent symptoms before they appeared. (P-Value = 0.000) Out of 744 participants, 169 experienced diarrhea, 162 headaches, and 149 vomiting as adverse effects. The majority of the people addressed these side effects by stopping their medication. The results are summarized in Table 3.

Table No. 3: Practices of Participants regarding self-medication.

Variables	Medical (%)	Allied Health Sciences (%)	Non-Medical (%)	Total (%)	P-Value	X^2-Value
In the previous year, have you used any medications without a prescription?						
No	71 (34)	78 (37.3)	60 (28.7)	209 (100)		
Yes	239 (44.7)	172 (32.1)	124 (23.2)	535 (100)	0.028	7.186
Why did you choose to self-medicate?						
Mild nature of illness	157 (53.6)	89 (30.4)	47 (16.0)	293 (100)		
Time Saving	50 (36.5)	40 (29.2)	47 (34.3)	137 (100)		
Nurse and Doctors are impolite	7 (19.4)	16 (44.4)	13 (36.1)	36 (100)		
Money Saving	21 (28.8)	26 (35.6)	26 (35.6)	73 (100)	0.000	73.440
Far from hospital	26 (33.3)	28 (35.9)	24 (30.8)	78 (100)		
Previous Knowledge	86 (50)	54 (31.4)	32 (18.6)	172 (100)		
Having idea about medicine	124 (39.0)	122 (38.4)	72 (22.6)	318 (100)		
Privacy	13 (35.1)	14 (37.8)	10 (27)	37 (100)		
Which illness have you used self-medication for in the past year?						
Cold/Cough	198 (49.7)	121 (30.4)	79 (19.8)	398 (100)		
Headache	144 (47.1)	96 (31.4)	66 (21.6)	306 (100)		
Diarrhea	85 (55.2)	43 (27.9)	26 (16.9)	154 (100)		
Fever	125 (43.4)	98 (34)	65 (22.6)	288 (100)		
Pain	92 (44.7)	68 (33)	46 (22.3)	206 (100)		
Sore Throat	118 (51.5)	65 (28.4)	46 (20.1)	229 (100)		
Vomiting	38 (38)	36 (36)	26 (26)	100 (100)		
Oral Ulcers	22 (66.7)	5 (15.2)	6 (18.2)	33 (100)	0.000	96.613
Acidity	45 (47.4)	24 (25.3)	26 (27.4)	95 (100)		
Generalized-Weakness	19 (32.8)	20 (34.5)	19 (32.8)	58 (100)		
Constipation	20 (33.9)	22 (37.3)	17 (28.8)	59 (100)		
Stomach Ache	26 (37.7)	24 (34.8)	19 (27.5)	69 (100)		
Sleeping Disorders	28 (62.2)	10 (22.2)	7 (15.6)	45 (100)		
Menstrual Symptoms	30 (50)	17 (28.3)	13 (21.7)	60 (100)		
Ear Infection	5 (26.3)	9 (47.4)	5 (26.3)	19 (100)		
Skin Problems	26 (46.4)	13 (23.2)	17 (30.4)	56 (100)		
Which class of drugs have you taken for self-medication?						
Antibiotics	203 (51.1)	98 (24.7)	96 (24.2)	397 (100)		
Pain Killers	185 (44.3)	156 (37.3)	77 (18.4)	418 (100)		
Anti-Pyretic	97 (44.3)	92 (42)	30 (13.7)	219 (100)		
Multi-vitamins	86 (48)	51 (28.5)	42 (23.5)	179 (100)		
Anti-Tussive	48 (45.3)	33 (31.1)	25 (23.6)	106 (100)		
Anti-Histamines	83 (56.5)	44 (29.9)	20 (13.6)	147 (100)		
Antacids	46 (51.1)	24 (26.7)	20 (22.2)	90 (100)	0.000	157.024
Anti-Diarrheal	54 (54)	28 (28)	18 (18)	100 (100)		
Anti-Emetics	31 (47.7)	19 (29.2)	15 (23.1)	65 (100)		
Sedatives	27 (67.5)	8 (20)	5 (12.5)	40 (100)		
Blood Pressure Lowering Drugs	6 (17.6)	8 (23.5)	20 (58.8)	34 (100)		
Psychoactive	12 (44.4)	5 (18.5)	10 (37)	27 (100)		
Anti-Spasmodic	16 (35.6)	20 (44.4)	9 (20)	45 (100)		
When did you begin self-medication?						
When confirmed through a medical lab test	23 (18.9)	53 (43.4)	46 (37.7)	122 (100)		
When symptoms are developed	269 (47.8)	176 (31.3)	118 (21)	563 (100)	0.000	41.785
Without symptoms for prevention	9 (24.3)	14 (37.8)	14 (37.8)	37 (100)		
For psychological effect	9 (40.9)	7 (31.8)	6 (27.3)	22 (100)		
Which drug system do you use for self-medication?						
Allopathy	291 (45)	217 (33.6)	138 (21.4)	646 (100)		

Homeopathy	14 (17.9)	27 (34.6)	37 (47.4)	78 (100)	0.000	36.282
Ayurveda/ Hakimi/ Unani	5 (25)	6 (30)	9 (45)	20 (100)		
What is the annual frequency of your self-medication?						
1	29 (31.2)	41(44.1)	23 (24.7)	93 (100)	0.086	11.065
2 to 3	118 (41.5)	98 (34.5)	68 (23.9)	284 (100)		
4 to 5	62 (39)	52 (32.7)	45 (28.3)	159 (100)		
More than 5	101 (48.6)	59 (28.4)	48 (23.1)	208 (100)		
What kinds of side effects do you experience as a result of self-medication?						
Nausea/Vomiting	146 (49.5)	99 (33.6)	50 (16.9)	149 (100)	0.000	61.505
Diarrhea	74 (43.8)	47 (27.8)	48 (28.4)	169 (100)		
Skin-Rash	17 (18.3)	36 (38.7)	40 (43)	93 (100)		
Stomach-Pain	66 (42.3)	59 (37.8)	31 (19.9)	90 (100)		
Headache	61 (37.7)	51 (31.5)	50 (30.9)	162 (100)		
How did you address the negative impact you encountered?						
Go to public tertiary care hospitals	63 (44.7)	53 (37.6)	25 (17.7)	141 (100)	0.000	44.195
Go to private doctor	96 (38.9)	69 (27.9)	82 (33.2)	247 (100)		
Go to Pharmacists	9 (20.9)	17 (39.5)	17 (39.5)	43 (100)		
Stop taking medication	120 (46)	97 (37.2)	44 (16.9)	261 (100)		
Others	57 (42.2)	42 (31.1)	36 (26.7)	135 (100)		

DISCUSSION

Self-medication is widespread in both industrialized and developing nations.[10] Its prevalence hasn't, however, been thoroughly researched among the medical, allied health sciences, and non-medical students together. The prevalence of self-medication ranges from 38.5 to 92% depending on the nation and area; in an Iranian study, the frequency was found to be 90%.[11] The prevalence percentage in our investigation was found to be 71.9%. The factors influencing self-medication were described by Alshahrani SM et al. Of the participants in our study, 18.4% reported self-medication as a time-saving option, compared to 64.2% in their report.[12] The two factors that most influenced our participants' decision to self-medicate were their knowledge of medication (42.7%) and the mildness of their sickness (39.5%). The same was observed in another study where educational background of the nursing students was a contributing factor towards self-medication.[13] In Nigeria, Esan DT et al. reported that unfriendly attitude of HCWs (27.7%) was the most common reason why Nigerian students opted for self-medication.[14] According to a study by Alshogran OY et al., medical students were more likely than non-medical students to use painkillers, making them the most commonly used medication.[15] This was in accordance with our study where 56.2% were self-medicating with pain killers, followed by antibiotics (53.4%) and Anti-pyretic (29.4%). Our study reported that the pain killer consumption rate was more in allied health sciences students followed by medical and non-medical students, whereas the antibiotic consumption rate was more among the medical students, followed by non-medical and students of allied health sciences. Analgesics were used for self-medication by 58% of dental students and 49% of medical students in a different Peshawar research.[16] Our participants were reported to be using allopathic medicines (86.8%) more as compared to other forms, (Medical > AHS > non-medical). In accordance to this, Hashemzaei M et al. also observed that allopathy was the most common (69.2%) type of medicine used among the participants.[17] Previous prescriptions were the most popular source of information for our participants (Medical > non-medical > AHS). A survey conducted in Malaysia also found that previous prescriptions were the most prevalent source of information (Medical > non-medical).[18] Headache and fever were the most common complaints, followed by colds, according to Araia ZZ et al. On the other hand, our data revealed that common colds were the most common symptoms.[19] In Bangladesh a study reported self-medication practices among male and female participants to be 45.2% and 42.8% respectively.[20] We studied that the male: female ratio for self-medication was 60.6%: 29.4%. In our study the prevalence rate among the medical, allied health sciences and non-medical students was 77.1%, 68.8% and 67.4%. The slight increase in prevalence among the medical students could be because of their medical background.

This research has several limitations. Convenient and non-probability sampling aimed to introduce issues of selection bias, which influences the generalizability of the research. The fact that data was based on self-reporting introduces response bias. The cross-sectional design measured only one point in time; hence, establishing causality or behavioral change over time is very difficult. However, the current study has some strengths, such as a large sample size, which increases the reliability and validity of results. Moreover, the sample consists of students belonging to various disciplines of studies, namely medical, allied health sciences, and nonmedical, hence giving a comprehensive view about self-medication practices across different fields of study. Ethical considerations like taking informed

consent and assurance about confidentiality were observed in the present study.

CONCLUSION

According to the findings of our study, self-medication practices were common among students studying medicine, allied health disciplines, and non-medicine. Despite the fact that the medical group had a slightly higher prevalence, there was no statistically significant difference. The study also demonstrated the prevalence of self-medication for minor ailments like fever, headaches, and colds. Additionally, the majority of participants did not support encouraging others to advocate self-medication, despite their unwillingness to give up their self-medication habits.

RECOMMENDATIONS

Education programs on safe medication use and policy improvements can be pursued to combat self-medication. Improvement in access to healthcare, especially in rural areas, and encouragement of consultation by pharmacists may reduce the rationale for self-medication. Awareness programs, responsible media advertising, and student support systems are critical needs for education and orientation. Further research and data generation will help in understanding and addressing the root causes of self-medication. Partnership with media for appropriate information and institute-based support systems will foster responsible health practices.

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Research Article
ISSN: 3006-5852 & ISSN: 3006-5844

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